



IMS Seminar Series



Doctor Peter Wölfle
Professor Emeritus
Institute for Theoretical Condensed Matter Physics (KIT)

Quantum Criticality in Heavy Fermion Compounds in the Absence of "Kondo breakdown"

Thursday, July 7, 2016

2 - 3 pm

Sig Hecker Conference Room (TA3 - 0032 room 134)

Abstract: Unusual quantum critical properties observed on several heavy fermion compounds have revived speculation on a "Kondo breakdown" scenario. We show that in two prominent cases, YbRh₂Si₂ and CeCu₆(Au), a new strong coupling theory of a "critical Fermi liquid" is able to account well for the observed scaling properties. The theory assumes a smooth crossover from heavy Fermi liquid to local moment magnetism rather than an abrupt breakdown of Kondo screening. In other cases a reconstruction of the Fermi surface has been observed, which may or may not be related to Kondo breakdown.

Biography: Peter Wölfle is an internationally renowned theoretical physicist with major contributions to condensed matter theory in systems with strong electronic correlations, mesoscopic systems and disordered systems. His pioneering works on quantum transport theory and the theory of quantum fluids have had great impact on current research efforts. His more recent work is on quantum criticality of metallic systems and on frustrated magnetic systems.

He is the recipient of numerous awards, most recently the *Gentner-Kastler Prize of the Société Française de Physique*, the *Deutsche Physikalische Gesellschaft* and the *Simon Memorial Prize of the Institute of Physics*. He has 250 publications in refereed Journals to his name.

For over 20 years he was a Professor at Institute for Theory of Condensed Matter, Universität Karlsruhe (as of 2009: Karlsruhe Institute of Technology (KIT)) and since 2010 has been Professor Emeritus and Consultant at KIT.

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Hosted by Alexander Balatsky * Director of the Institute for Materials Science